Recovery Management Agreements as a Mechanism for Delisting Species

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What might an RMA look like? As a case study, I offer the Borax Lake chub (*Gila boraxobius*): a small fish (typically 1.3-2 inches in length) endemic to a small (10.2-acre), shallow (less than 3 feet), and highly mineralized, alkaline lake and its associated wetlands in eastern Oregon's high desert.[1] Borax Lake, which is fed by several subterranean hot springs, is an unusual ecosystem, in part because it is a "perched" lake: precipitation of minerals from the water over the millennia has raised the level of the lake approximately 30 feet above the salt crust that covers the adjacent desert playa. The perched nature of the lake has isolated the chub from the surrounding watershed. It also renders the lake and the fish particularly susceptible to both natural and human disturbances.

The springs flowing into the lake have temperatures between 95 and 104 F. The chub prefers water of 84-86 F; temperatures above 93 F are potentially lethal. The chubs therefore live around the shallow perimeter of the lake and in the wetlands at the lake's outflow where the temperature is within their preferred range. This further reduces the available habitat to only a fraction of the lake's

[1] The discussion of the biology of the species and physical description of its critical habitat are based on U.S. FISH & WILDLIFE SERVICE, RECOVERY PLAN BORAX LAKE CHUB (*GILA BORAXOBIUS*) (1987) [hereinafter cited as RECOVERY PLAN]; U.S. Fish & Wildlife Service, *Endangered Status and Critical Habitat for the Borax Lake Chub,* 47 Fed. Reg. 43,957 (1982) (to be codified at 50 C.F.R. pt. 17) [hereinafter cited as *Final Listing*]; U.S. Fish & Wildlife Service, *Proposed Endangered Status and Critical Habitat for the Borax Lake Chub (Gila Boraxobius),* 45 Fed. Reg. 68,886 (1980) (to be codified at 50 C.F.R. pt. 17) [hereinafter cited as *Proposed Listing*]; U.S. Fish & Wildlife Service, *Emergency Determination of Endangered Status and Critical Habitat for the Borax Lake Chub,* 45 Fed. Reg. 35,821 (1980) (to be codified at 50 C.F.R. pt. 17) [hereinafter cited as *Emergency Listing*]; NatureServe, Gila boraxobius - *Williams and Bond, 1980* (visited Sept. 1, 2005) <http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Gila+boraxobius>; U.S. Fish & Wildlife Service, *Borax Lake Chub (*Gila boraxobius*)* (visited Sept. 1, 2005) <http://ecos.fws.gov/docs/life_histories/E027.html>; U.S. Geological Service, *Status of Listed Species and Recovery Plan Development, Borax Lake Chub* (visited Sept. 1, 2005) <http://www.mpwrc.usgs.gov/resource/distr/others/recoprog/states/species/gilabora.htm>.

area. It also makes the species particularly vulnerable to decreases in water level.

Prior to 1980, the chub was considered to be a dwarfed population of the Alvord chub (*Gila alvordensis*),[2] the species found in the watershed surrounding Borax Lake. During the Pleistocene, the floor of the Alvord Basin was covered by a large, pluvial lake that was the ancestral home to the chub. The lake dried up some 7,000 to 10,000 years ago, restricting the fish to scattered populations in the few permanent waters that remained, primarily springs and creeks. Isolation from other populations of the Alvord chub plus a combination of extreme environmental conditions, short generation times in the warm water, and the small number of founding individuals, led to a rapid differentiation of the Borax Lake chub into a distinct, endemic species.[3]

In 1980, as the paper characterizing the Borax Lake chub as a distinct species was in the editorial process, two activities around the lake were threatening its environment and its continued existence. First, the rancher who owned the lake and the surrounding 160 acres cut channels into its perimeter to irrigate forage on the surrounding grazing lands. In addition to lowering the lake level, the channels redirected the flow of water from the lake's natural outflow, drying up the wetlands and an intermittent lake (Lower Borax Lake). Second, the federal agency that managed the land adjacent to the lake, the Bureau of Land Management (BLM), began the process to issue leases to permit the geothermal development of the Alvord Basin.[4] Exploratory drilling posed a risk of drying up

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[2] The Alvord chub was itself an undescribed species in 1966. *See* Carl E. Bond, Endangered Plants and Animals of Oregon: I. Fishes 2, fig. 4 (Jan. 1966) (Agricultural Experiment Station, Oregon State University, Special Report 205) ("Carl L. Hubbs of the Scripps Institution of Oceanography has under study a new species of minnow from the Alvord drainage and Catlow Valley. This species may represent an undescribed genus. It is found in many of the permanent waters of the drainages mentioned.").

[3] Jack E. Williams & Carl E. Bond, Gila boraxobius, *A New Species of Cyprinid Fish from Southeastern Oregon with a Comparison to* Gila alvordensis *Hubbs and Miller,* 92 PROC. BIOLOGICAL SOC'Y WASH. 291 (1980).

[4] The U.S. Geological Survey (USGS) had previously designated the Basin as a Known Geothermal

the lake by changing the subsurface flow of water to the springs that feed the lake.

In response to BLM's proposal to lease 6,789 acres of federal land surrounding Borax Lake, the USFWS promulgated an emergency regulation listing the chub as an endangered species on May 28, 1980.[5] In the emergency listing, the agency emphasized the threatened modification of the chub's habitat.[6] The lake's "position above the valley floor," the USFWS noted, made it vulnerable to modification for irrigation which both lowered the level of the lake and diverted water away from the natural outflow.[7] Geothermal exploration and development were also a threat to the species. The listing was necessary, the agency concluded, to ensure that the BLM would consider the "welfare of this species during its deliberations" on both the leasing decision and on the stipulations to be included in any leases that might eventually be issued.[8] The listing package also included a designation of critical habitat[9] on 3840 acres of land surrounding the

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Resource Area. *See Emergency Listing, supra* note XXX , at 35,822. The private land on which Borax Lake was located had been leased by the landowner to Getty Oil Company.

[5] *Id.* at 35,821. On the Secretary's authority to make emergency listings, see 16 U.S.C. 1533(b)(7) (2000). The species has also been listed as endangered by the Desert Fishes Council, Jack E. Williams et al., *Endangered Aquatic Ecosystems in North American Deserts with a List of Vanishing Fishes of the Region,* 20 J. ARIZ.-NEV. ACAD. SCI. 1, 7 (1985), as vulnerable by the International Union for the Conservation of Nature and Natural Resources, IUCN SPECIES SURVIVAL COMMISSION, 1996 IUCN RED LIST OF THREATENED ANIMALS 72 (1996), and as a species of special concern (as a population of the Alvord chub since the Borax Lake chub was not recognized as separate species until 1980) by the American Fisheries Society, James E. Deacon et al., *Fishes of North America Endangered, Threatened, or of Special Concern: 1979,* FISHERIES, Mar.-Apr., 1979, at 29, 34.

[6] *Emergency Listing, supra* note XXX , at 35,822. The other statutory threats were determined not to be present. *Id.*

[7] *Id.*

[8] *Id.*

[9] Critical habitat is defined as

> (i)the specific areas within the geographical area occupied by the species, at the time it is listed ... on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and
>
> (ii)specific areas outside the geographical area occupied by the species at the time it is listed ... upon a determination by the Secretary that such areas are essential for the conservation of the species.

16 U.S.C. • 1532(5)(A) (2000). Designation of critical habitat is to be made, "to the maximum extent prudent and

lake.[10]

As a result of the listing of the chub, BLM was required by section 7 of the ESA to consult with the USFWS on its proposal to lease lands for geothermal exploration.[11] The BLM requested formal consultation with the USFWS on July 3.[12] Following several exchanges of documents and a meeting in September that was attended by the USFWS, USGS, BLM, Anadarko, Getty Oil, several state agencies, two private utilities, "and various environmental and engineering consulting firms,"[13] the USFWS issued a biological opinion concluding that granting "geothermal exploration leases, with present stipulations, for BLM Leasing Units 28, 33 and 34 is likely to jeopardize the continued existence of the Borax Lake chub and/or adversely modify its critical habitat."[14] As a component of its jeopardy opinion, the USFWS was required to provide "reasonable and prudent alternatives" to the action that would not jeopardize the species.[15] At the

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determinable," at the time of listing. *Id.* • 1533(a)(3). As with the status determination, the habitat designation is to be made "on the basis of the best scientific data available," but the Secretary is also to consider "the economic impact, and any other relevant impact, of specifying any particular area as critical habitat." *Id.* • 1533(b)(2). The utility of critical habitat designations is an intensely debated issue. *Compare* Kieran Suckling & Martin Taylor, *Critical Habitat and Recovery, in* THE ENDANGERED SPECIES ACT AT THIRTY: RENEWING THE CONSERVATION PROMISE 73 (Dale D. Goble et al. eds. 2005), *with* Michael J. Bean, *The Agony of Critical Habitat,* ENVTL. FORUM, Nov.-Dec., 2004, at 18; *see generally* Goble, *supra* note 21, at .

[10] *Emergency Listing, supra* note XXX , at 35,822. Geothermal exploration threatened to adversely modify the designated habitat through subsidence (from removing water from the aquifer) and alteration of the thermal springs' flows. Geothermal resource development -- if it were to follow exploration -- threatened additional adverse impacts. *Id.* at 35,822-23.

[11] Section 7(a)(2) requires federal agencies, "in consultation with" the wildlife agency, to "insure that any action authorized, funded, or carried out by such agency ... is not likely to jeopardize the continued existence of any [listed] species or result in the destruction or adverse modification of [its critical] habitat." 16 U.S.C. • 1536(a)(2).

[12] Oregon State Office, U.S. Fish & Wildlife Service, Formal Section 7 Consultation for BLM Geothermal Leasing Units 28, 33, and 34 near Borax Lake, Oregon 23 (Oct. 10, 1982).

[13] *Id.*

[14] *Id.* at 23. The opinion noted, "the key concern is the likelihood that drilling might impact th[e] fault system" along the basin floor that is the source of the thermal springs that feed the lake and the cold water aquifers that reduce the temperature of the springs. *Id.* at 27.

[15] 16 U.S.C. • 1536(a)(3)(A).

September meeting, the geologists had agreed that a half-mile buffer around the lake and the associated hot springs north of the lake "would probably provide adequate protection to the aquifers."[16] The USFWS, therefore, recommended that any leases include a half-mile buffer, an at-least-weekly monitoring program of the quantity and quality of spring waters within the buffer zone, and a mandatory shut-down if any changes to water quality or quantity were detected.[17] BLM adopted these recommendations as stipulations on the leases that it subsequently issued to Anadarko.[18]

Since an emergency listing is only effective for 240 days,[19] the USFWS initiated procedures to list the chub as endangered in mid-October, 1980.[20] The listing was finalized nearly two years later on October 5, 1982.[21] In its decision, the agency concluded that irrigation diversions and potential geothermal development continued to be the most significant threats to the species.[22] Although no new diversions had been made since 1980, they remained a threat because there were no legal prohibitions against diverting water from the lake.[23] Similarly, the threat from drilling had been reduced but not eliminated. Finally, the agency noted that the existing regulatory mechanisms were also inadequate:

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[16] Oregon State Office, *supra* note 40, at 27. Since the standard lease stipulations provided only a 600-foot buffer, they were insufficient to provide the needed reasonable assurances.

[17] *Id.* at 28-29.

[18] USFWS relied upon inclusion of the stipulations in subsequently adjusting the boundaries of critical habitat to reduce the area from the 3840 acres designated in the emergency listing to 640 acres. *Final Listing, supra* note XXX , at 43,957 (codified at 50 C.F.R. •• 17.11, 17.95(e)).

[19] 16 U.S.C. • 1533(b)(7) (2000).

[20] *Proposed Listing,* note XXX *supra*.

[21] *Final Listing,* note XXX *supra*. The listing came after Anadarko Production Company, the lessee of the BLM lease units, filed a plan of operation -- the document that initiates the post-leasing, exploratory phase -- for one of the leases in March 1982. *See* RECOVERY PLAN, *supra* note XXX , at 21.

[22] *Final Listing, supra* note 30, at 43,958.

[23] *Id.*

although the species was on the Oregon endangered species list, the state had taken no steps to protect its habitat.[24]

With the listing of the chub, designation of its critical habitat, and the preliminary amelioration of the immediate threats associated with geothermal leasing, conservation of the species entered a new phase. Before the USFWS prepared a recovery plan, however, other entities were working to conserve the species.

The first steps were taken by The Nature Conservancy (TNC) in 1983, when it obtained a ten-year lease of the 160 acres of private land that bounded the lake; the lease included a right of first refusal for the purchase of the property. TNC, however, agreed to allow continued water diversions from the lake and cattle grazing on the surrounding land.[25] Shortly after acquiring the lease, organization began steps to return the outflow of Borax Lake into its former, natural channel in order to rehydrate the wetlands to increase available habitat for the species. This proved far more difficult than expected and work continued through 1985 before flows approximating the pre-1980 conditions were restored and the wetlands were again wet.[26]

Also in 1983, BLM designated the 600 acres of federal land around Borax Lake as an Area of Critical Environmental Concern (ACEC).[27] The management

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[24] *Id.* at 43,958.

[25] *Id.* at 22.

[26] *Id.* at 25.

[27] Department of the Interior, Burns District, Oregon, *Areas of Critical Environmental Concern*, 48 Fed. Reg. 30,202 (1983) (designating 520 acres as the "Borax Lake ACEC"). ACECs are areas "where special management attention is required (when such areas are developed or used or where no development is required) to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources or other natural systems or processes, or to protect human life and safety from natural hazards." Federal Land Policy and Management Act, 43 U.S.C. • 1702(a) (2000). As the BLM *Manual* notes, the designation thus serves as a "reminder" that significant values or resources exist which "must be accommodated when future management actions or land use proposal are considered near or within the ACEC." Bureau of Land Management, Manual • 1613.02 (1988). The agency is to give priority to ACECs, both in preparation of the inventory of publics lands and in preparing land use plans. 43 U.S.C. •• 1711(a), 1712(c)(3). *See also* 43 C.F.R. • 1610.7-2 (2004) (designation of

standards applicable to the ACEC are intended to limit and control access by vehicles.[28]

The USFWS did not finalize a recovery plan for the species until 1987.[29] As required by the *Guidelines*, the plan describes the chub, its habitat, and the threat factors it and its habitat face.[30] The plan highlights three factors: the modification of the lake and its natural outflow through the construction of irrigation diversions; the risk of draining the lake as a result of geothermal development; and the negative impacts of off-highway vehicle (OHV) use.[31] The plan also established recovery goals for the species.[32] Unlike most species, the plan's author noted, the chub was not at risk as a result of population declines (the 1980 populations levels were presumed to be the historical levels) and therefore "maintenance of a certain number of individuals is not as relevant to the survival of the Borax Lake chub as is protection of the integrity of the aquifer and shoreline."[33] The plan thus emphasized actions to protect the species' habitat: securing land and water rights,[34] restoring Lower Borax Lake and the intervening marshes, protecting the lake's ecosystem (primarily through restriction of access), monitoring the status of that ecosystem, encouraging public support through education, and utilizing laws

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Areas of Critical Environmental Concern).

[28] Burns District, Bureau of Land Management, Resource Management Plan for Andrews Management Unit 70-71 (July 2005).

[29] Recovery Plan, note XXX *supra.*

[30] *Id.* at 1-19.

[31] *Id.* at 18-19.

[32] It specified both goals necessary to reclassify the species from endangered to threatened, *id.* at 27, and to delist the species as recovered. *Id.* at 28-29.

[33] *Id.* at 14.

[34] The plan called for permanent protection for both the 160-acre parcel surrounding Borax Lake and another 160-acre parcel north of the lake "by The Nature Conservancy or other appropriate Public Resource Agency" and withdrawal of the Lake's waters from appropriation under state water law. *Id.* at 27-28; *see also id.* at 33-34.

and regulations to protect the chub and its habitat.[35] Finally, the plan presented a detailed, step-down outline of the tasks and a lengthier narrative description of the requirements necessary to recover the species.[36]

With the completion of the recovery plan for the chub, the first phase of the conservation of the species was completed. Steps had been taken by the federal land-managing agency both to ameliorate the immediate threats to the species from geothermal exploration and to ensure that the lands surrounding the lake would receive special attention. In addition, a national conservation organization had taken steps to acquire the lake and the private lands around it. Although the USFWS concluded that these actions were not sufficient to justify either downlisting or delisting the species, the recovery plan did outline what additional measures were required.

In 2003, the USFWS contracted with Southern Oregon University for a review of the progress being made to meet the recovery goals for the chub. The resulting report noted that "[n]umerous recovery measures have been implemented during the past two decades that have improved the conservation status of the Borax Lake chub and protection of its habitat."[37] These included the designation of critical habitat, BLM's designation of the federal lands around Borax Lake as an ACEC, the TNC lease and subsequent purchase (in 1993) of both the private parcel surrounding the lake and another, adjacent parcel, and the adoption of the Steens Mountain Cooperative Management and Protection Act of 2000[38] which withdrew the public lands (including the Alvord Basin Known

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35 *Id.* at 35-45.

36 *Id.* at 30-45.

37 JACK E. WILLIAMS & CATHERINE A MACDONALD, A REVIEW OF THE CONSERVATION STATUS OF THE BORAX LAKE CHUB, AN ENDANGERED SPECIES 2 (2003).

38 Steens Mountain Cooperative Management and Protection Act, 16 U.S.C. ⇔ 460nnn-1 to -122 (2000).

Geothermal Resource Area) from mineral and geothermal development.[39] The report also noted, however, that all was not well: gates on the access road to the lake were unlocked and there was evidence of "significant recreational use," including motorcycle and OHV damage to the salt crusts within the ACEC west of the lake[40] and disturbance to the lake bed from people wading in it.[41]

The report's authors evaluated the status of the chub against two standards. First, they assigned a numerical value to reflect the degree of implementation of each of the 1987 recovery plan's six goals (*see* table 1):[42]

Table 1
Numerical Scores for Recovery Goals[43]

1. securing land and water rights	3.7
2. restoring Lower Borax Lake and the intervening marshes	4.0
3. protecting the Lake's ecosystem	2.7
4. monitoring the status of the ecosystem	2.3
5. encouraging public support through public awareness	3.5
6. utilizing laws and regulation to protect the chub and its habitat	2.5

0 = no implementation
1 = minor implementation
2 = approximately half implemented
3 = mostly implemented
4 = fully implemented

In addition, the report's authors evaluated the chub's status in relation to

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39 *Id.* • 460nnn-81(a)(2).

40 RECOVERY PLAN, *supra* note 30, at 7.

41 *Id.* at 9.

42 *Id.* at 10-12; *see also* App. A at 27-32.

43 WILLIAMS & MACDONALD, *supra* note xxx , at 10-12.

the ESA's list of threat factors. The report noted that, although the original threats of diversions of water from the lake for irrigation and the geothermal development had been reduced,[44] OHV and recreational use posed new threats, including "damage to soils, wetlands, and lake shoreline from off-highway vehicles, and impacts to water quality, lake substrates, and lake shorelines [from] wading, camping, and boating."[45] Similarly, disease and predation had not been a threat to the species in 1982; by 2003, however, "increased vehicle access and visitation make the introduction of non-native species an increasing concern."[46] Finally, the report's authors noted that the chub's restricted range meant that it was "vulnerable to loss from a single disturbance [which] could take the form of vandalism, introduction of non-native species, or collapse of the lake shoreline."[47] Nonetheless, the report was broadly optimistic: "With acquisition of private lands including Borax Lake by The Nature Conservancy, careful management of the rest of the critical habitat by the BLM, and passage of the Steens Mountain legislation, the Borax Lake chub appears to be nearing recovery."[48]

The USFWS convened an expert panel of 16 scientists to evaluate the report.[49] The panel agreed that, despite the "substantial" progress that had been made, "threats to the species and ecosystem remain."[50] Given these threats -- increased recreational use and the potential for the introduction of non-native species[51] -- the panel concluded that the chub remained endangered and no change in listing status was warranted. Echoing the report's authors, the panel concluded that, "[b]ecause of the restricted range of the Borax Lake chub to a single area, the species is vulnerable to catastrophic loss despite existing

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[44] TNC acquisition of the land, establishment of an instream water right by the state, and the withdrawal of the basin from geothermal development in the Steens Mountain Cooperative Management and Protection Act removed the threats cited in 1982. RECOVERY PLAN, *supra* note XXX , at 10, 12-13.

[45] *Id.* at 13.

[46] *Id.*

[47] *Id.* at 14.

[48] *Id.* at 3.

[49] *See id.* at App. b.

[50] *Id.* at 14.

[51] *Id.* at 14-15. Goldfish had been introduced into another lake north of Borax Lake.

protection."[52]

The recommendation of both the report's authors and the expert panel neither to delist nor to reclassify the species raises the central question of this article: how can recovery be achieved given the presence of continuing threats? The chub is far from unusual in the continuing threats -- habitat degradation from human activities (OHV and recreational use) and competition from non-native species -- it faces. And because the chub's population has remained unchanged since before it was listed, the species presents the risk management conundrum clearly: the species is at risk because there is no entity that has assumed responsibility for ongoing risk management.

The irony of the ESA is that, other than the Act itself, neither federal nor state law provides significant, focused protection against threats such as habitat degradation and nonnative species that generally will require continuing monitoring and conservation management.[53] Although there are other, more broadly applicable statutes that protect habitat (*e.g.,* the Clean Water Act,[54] state fish and game laws, and local zoning regulations), such statutes are unlikely to be sufficient to protect most listed species because such statutes only protect habitat in the process of advancing other objectives (such as assuring clean water) and thus do not provide assurances of ongoing management in the absence of the other objectives. Similarly, existing statutes on nonnative species (*e.g.,* the Nonindigenous Aquatic Nuisance Prevention and Control Act[55] and state noxious weed control programs) are insufficiently tailored to be of much assistance. Thus, the very strength of the ESA in preventing extinction becomes a deterrent to delisting a species because to do so will frequently remove the protection needed to conserve it -- and thus lead to a downward spiral that would necessitate relisting.

The Borax Lake chub is an example of this irony. The expert review panel that USFWS assembled to evaluate the chub's status emphasized repeatedly that the threats that the species faced were ongoing, that they could be managed but not eliminated; they stressed, for example, that "development and

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[52] *Id.* at 15; *see also id.* at 19-21.

[53] Doremus, note XXX *supra*; Goble, note XXX *supra*; Williams et al., *supra* note XXX , at 24. These are the types of the threats that most listed species face. David Wilcove et al., *Leading Threats,* note XXX *supra.*

[54] 33 U.S.C. •• 1251-1387 (2000).

[55] 16 U.S.C. •• 4701-4741 (2000).

implementation of a monitoring strategy is critical to the conservation of the Borax Lake ecosystem."[56] Finally, the panel suggested that, while TNC and BLM could provide the necessary monitoring and management, they needed to be more actively engaged in conserving the species.

One element of a solution to this problem requires a shift in perspective through the formal recognition of past practices. For example, Robbins' cinquefoil (*Potentilla robbinsiana*), a long-lived dwarf member of the rose family, was restricted to a single site in New Hampshire at the time of listing. This site was bisected by the Appalachian Trail and the species' abundance had been substantially reduced due to trampling and habitat destruction caused by hikers.[57] By 2002, the species had been biologically recovered: the total number of individuals had grown from less than 2,000 to more than 14,000 specimens in the four separate populations.[58] The increased number of individuals and the physical separation of the populations made the species less susceptible to a random, catastrophic events and thus met the threshold requirement.[59] The USFWS addressed the continuing the risk-management issues through a series of agreements that secured the species' habitat and provided for the ongoing management of that habitat. The USFWS, the landowner (U.S. Forest Service [USFS]), and a conservation organization (the Appalachian Mountain Club) had taken several steps to reduce the impact of hikers: the trail was re-routed away from the original population, a wall was constructed around the population's location and posted with "closed entry" signs. Finally, a series of conservation-management agreements provided for ongoing risk-management. A Club naturalist is present during the summer at a hut near the population and, along with other staff at the hut, monitors human interaction with the population.[60] In December 1994, the USFWS and the USFS entered into a memorandum of understanding (MOU) for the conservation of the species under which the USFS

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[56] WILLIAMS & MACDONALD, *supra* note XXX , at 21. The panel emphasized a need to monitor both visitors to the lake and the lake's biological and geological parameters. *Id.* at 17-8, 21-22.

[57] U.S. Fish & Wildlife Service, *Determination of Pontententilla* [sic] *robbinsiana to Be an Endangered Species, with Critical Habitat,* 45 Fed. Reg. 61,944, 61,945 (1980).

[58] U.S. Fish & Wildlife Service, *Removal of* Potentilla robbinsiana *(Robbins' cinquefoil) from the Federal List of Endangered and Threatened Plants,* 67 Fed. Reg. 54,968, 54,973 (2002) [hereinafter cited as *Cinquefoil Delisting*].

[59] In addition, seed is collected annually for storage in a seed bank. *Id.* at 54,970.

[60] *Id.* at 54,970, 54,972-73.

agreed to continue to carry out management measures after delisting.[61]

Robbins' cinquefoil thus was delisted because (1) translocation and habitat restoration had increased the number of individuals and populations sufficiently to provide reasonable assurance against stochastic risk and (2) the threats requiring continuing risk management -- trampling and habitat destruction by hikers -- had also been reduced to a reasonable level (a) through an MOU with the land-managing agency that the habitat would be managed to maintain its biological value to the species and (b) through an agreement with a conservation organization to provide monitoring and ongoing educational activities.[62]

In its consensus findings on the conservation status of the Borax Lake chub, the expert panel convened by the USFWS provided a detailed discussion of both the threats facing the species and the steps necessary to manage those threats.[63] The discussion offers a description of the components that would be required for an RMA for the species.

The panel focused on the four threats facing the species: recreation, non-native species, groundwater withdrawals, and the species' restricted range. Its mitigation proposals take on a repetitive cadence: monitoring, access restrictions, and education. The field visits to the lake had found gates unlocked, OHV use within the critical habitat (with a resulting degradation of the area), and a lack of signs explaining the area's sensitivity.[64] To determine the timing of use, types of visitors, and their impacts on the ecosystem, the panel proposed an extensive monitoring program that included quarterly site visits to monitor the physical integrity of the site, annual fish, invertebrate, and water quality monitoring, visitor use monitoring, and annual evaluation of the collected data;[65] it also

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[61] The USFS agreed to provide "long-term protection on the Forest irrespective of the species standing under the Endangered Species Act." U.S. Forest Service and U.S. Fish & Wildlife Service, Memorandum of Understanding for the Conservation of Robbins' Cinquefoil (*Potentilla robbinsiana*) 1 (Dec. 2, 1994). The USFWS agreed to maintain the Monroe Flats habitat, "vigorously protect[]" the species from take through human disturbance, to train personnel, and to provide educational and interpretational information to visitors to the forest. *Id.* at 3.

[62] The Columbian white-tailed deer and Hoover's wooly-star are additional examples. U.S. Fish & Wildlife Service, *Final Rule to Remove the Douglas County Distinct Population Segment of Columbian White-tailed Deer from the Federal List of Endangered and Threatened Wildlife,* 68 Fed. Reg. 43,647 (2003); U.S. Fish & Wildlife Service, *Removing Eriastrum hooveri (Hoover's woolly-star) from the Federal List of Endangered and Threatened Species,* 68 Fed. Reg. 57,829, 57,831 (2003).

[63] WILLIAMS & MACDONALD, *supra* note 73, at 14-24.

[64] *Id.* at 16-17.

[65] *Id.* at 17, 22.

recommended research to determine the risk to the lake's ecosystem from potential groundwater development in the basin.[66] It advocated eliminating vehicle use of the area around the lake and boat access to the lake.[67] The panel also proposed an educational program to inform visitors of "the unique and fragile features of the ecosystem and minimize the threat of non-native species.[68]

The panel's discussion outlines what would be required for an RMA to reclassify the species from its current endangered status to threatened as a first step to delisting the species as recovered: restrictions on vehicular access, an informational campaign to inform visitors of the site's fragility, and a monitoring program sufficient to alert managers to any changes in the biotic and abiotic environment. These actions are not dependent upon the ESA: as the land-managing agency and the landowner, BLM and TNC have the ability to control vehicular and individual access to the lake and its surroundings;[69] they can also provide interpretative signage at the site; finally, TNC and BLM have the expertise necessary to develop and implement a monitoring program. An RMA could be drafted that would ensure that these actions were implemented and that the USFWS would be kept apprised of the results of the monitoring program.

But, as the panel noted, although frequent monitoring can reduce the threats, the chub's vulnerability "cannot be eliminated"[70] -- a statement that could be made about most species which face threats that can at best be managed rather than eliminated. This raises a question that might be framed in at least two ways: is the degree of risk that the species faces acceptable? or: is the species less at-risk if it remains listed than it would be if it were not? The latter framing of the question raises not only the idiosyncratic factual questions posed by the first

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66 *Id.* at 19. The integration of state ground and surface water management is a largely unrealized goal. Since the surface right (the instream appropriation) would predate the new pumping, in theory a least the surface right is paramount. In addition, the decision in *Cappaert v. United States,* 426 U.S. 128 (1976), suggests that the would be a claim for federal reserved rights.

67 WILLIAMS & MACDONALD, *supra* note 73, at 18.

68 *Id.* at 18.

69 There is a potential for some conflict between competing TNC objectives. On the one hand, the organization has a lengthy record of successful conservation management. On the other hand, the need to raise funds can lead it to advertising fragile areas such as Borax Lake. The TNC website, for example, has a stunning picture of mist rising from Borax Lake with a snow-capped Steens Mountain in the background; the lead paragraph is a discussion of "Why you should visit." The Nature Conservancy, *Borax Lake* (visited Sept. 18, 2005) <http://nature.org/wherewework/northamerica/states/oregon/preserves/art6794.html>.

70 WILLIAMS & MACDONALD, *supra* note 73, at 20.

but also more general legal issues.